

REMARKS

Applicant's representative wishes to thank the Examiner for the telephonic interview conducted on June 11, 2007. To recap the interview, we discussed the claims examined in the Office Action of April 17, 2007, and the Sakai et al. reference. This Response summarizes our points of discussion and provides citations to Sakai et al. to support Applicant's contention, as requested by the Examiner.

In the Office Action of April 17, 2007, all of the pending claims were rejected under 35 U.S.C. §102(b) and 102(e), as anticipated by Sakai et al. (US 7,194,144) or under 35 U.S.C. §103(a) as unpatentable over Sakai et al. in view of Nakao (US 6,459,819). Applicant respectfully traverses the rejections.

Claim 1:

Claim 1 of the present application includes the following limitation¹:

receiving direction information indicative of a direction of relative movement between the image capture device and the document during the capture of the plurality of partially overlapping digital images.

The Office Action states that this limitation is disclosed in Sakai et al. at Figure 32; col. 10, ll. 1-50; col. 24, ll. 1-5. The Office Action also states that the "reading direction" referred to at col. 24, l. 2 is the same as the direction information recited in Claim 1. Applicant respectfully disagrees, and respectfully submits that the limitation noted above is not disclosed in Sakai et al.

As explained below, the "reading direction" in Sakai et al. does not refer to camera movement or capture direction, but rather refers to the direction of text on a page. For example, English text is printed from left to right across horizontal lines on a page (the reading direction is left to right), while traditional Chinese text is printed top to bottom along vertical lines on a page (the reading direction is top to bottom). Sakai et al. contrasts these reading directions to one another in Figs. 8A and 8B, 10A and 10B, and 14A and 14B. As explained below, Sakai et al. utilizes information about the reading

¹ Claim 1 also recites using the direction information to combine two electronic text files.

direction to simplify the process of finding overlapping regions of text among a plurality of captured images. Sakai et al. does not disclose inputting the moving direction of the camera or detecting the moving direction of the camera.

Sakai et al. discusses at length detecting the direction of text on a page and using that information to merge images together. For example, Sakai et al. provides “[i]nitially, a line direction in a document image is identified (step S401 of FIG. 4).” col. 7, ll. 11-12

In Sakai et al., the line direction is determined by detecting the direction of highest concentration of black pixels on a page. If the concentration is higher in the vertical direction than in the horizontal direction, then the text is oriented in the vertical direction (e.g., traditional Chinese text). If the concentration is higher in the horizontal direction than in the vertical direction, then the text is oriented in the horizontal direction. Sakai et al. then explains how the text direction is used:

In this process, if a document is horizontally written, the direction where the document images stored in the first and the second image storing units 12 and 13 are read sequentially from the top to the bottom in pixel lines in a horizontal direction, is selected. If the document is vertically written, the direction where the document images are read sequentially from the right to the left in pixel lines in a vertical direction, is selected. col. 7, ll. 50-57

From the above passage, it can be understood that the images are first captured and stored, and then the text direction is determined. Next, Sakai et al. explains that comparison directions (whether to compare the bottom of one image to the top of another, or to compare the right side of one image to the left side of another) are selected based on the text direction and the “tendency” to capture images in a certain direction based on the text direction. For example, if the document has horizontal text, then the tendency would be to first capture a top image and then a bottom image that partially overlaps the top image. However, if the document has vertical text, then the tendency would be to first capture a left image and then a right image that partially overlaps the left image.

The tendencies are not absolute. Instead, priorities are assigned based on the tendencies. If a document has horizontal text, then a top priority is given to the

assumption that a top portion of an image is first captured and then the bottom portion. However, if a comparison attempt fails under this assumption, a second priority is assumed. The second priority assumes that the bottom portion of an image was captured first and then the top portion. This process of assuming, but not knowing, camera direction is discussed through cols. 9 and 10 of Sakai et al. Sakai et al. makes no reference to receiving direction information indicative of an actual direction of relative movement between the image capture device and the document.

The process of merging images using the analysis discussed above is further discussed at col. 11, ll. 26-42; col. 15, line 12 et seq.; col. 20, line 50 et seq. At col. 13, ll. 39-47, Sakai et al. states:

. . . if no matching line image exists as a result of the comparison made between all the line images in the first document image and the first line image in the second document image, it is determined that the document **scanning direction** is different, namely, it is determined that the upper half of the document is not firstly scanned and its lower half is not secondly scanned. Accordingly, the line images are compared in the comparison direction with the second highest priority. (bold added)

Here, as throughout the specification, Sakai et al. refers to *camera movement* as a “*scanning direction*” (not a “*reading direction*”). See also col. 7, line 21, et seq. and col. 10, line 2. The reading direction referred to at col. 24, l. 2 pertains to providing the text direction to the device so that it does not have to be detected by analyzing black pixels, thereby simplifying part of the process of merging sections. Sakai et al. does not disclose receiving actual direction information as recited in claim 1. Also, Sakai et al. does not suggest or teach modifying any of the disclosed embodiments for receiving direction information.

For at least the reasons stated above, Sakai et al. does not anticipate or render obvious claim 1. It is respectfully submitted that claim 1 is patentable over the cited references and the rejection should be withdrawn. Similarly, claims that are dependent on claim 1 are also patentable over the cited references for at least the same reasons as claim 1.

Claims 7 and 12

Independent claims 7 and 12 in the present application include limitations that are similar to the limitation discussed above. For example, claim 7 provides:

... a controller configured to receive direction information indicative of a direction of movement of the digital camera during capture of the plurality of digital images ...

and claim 12 provides:

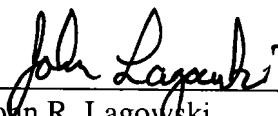
... and to stitch the electronic text files together based at least in part on the ... direction information indicative of a direction of relative movement of the image capturing apparatus ...

Accordingly, claims 7 and 12 and their respective dependent claims are believed patentable over the cited references for at least the same reasons as claim 1.

Conclusion

In view of the above remarks, Applicant respectfully requests that the Examiner withdraw the rejections and submits that this application is in condition for allowance. If for any reason the Examiner is not able to allow the application, he is requested to contact the Applicant's undersigned attorney at (312) 321-4200.

Respectfully submitted,



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